

# Технические характеристики на преобразователи напряжения DC/DC серии PH-S и PH-F

**По вопросам продаж и поддержки обращайтесь:**

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# PH-S Series

Simple Function 50W to 600W  
DC-DC Converters

- High Density
- Wide Range Input
- Output adjustment Capability
- Remote On/Off
- Fixed Switching Frequency
- International Safety Approvals

## Key Market Segments & Applications

Telecom  
Custom Power Supplies  
Point of Load

## PH-S Features and Benefits

### Features

- High density
- Low component count
- Fixed operating frequency
- Variety of input voltages

### Benefits

- Smaller package size
- High reliability Demonstrated 5 million hours MTBF
- Easier system filtering
- Systems can operate from different input voltages

## Specifications

|                                    |     | 3.3V                                                                                   | 5V        | 12V       | 15V       | 24V       | 28V       | 48V       |
|------------------------------------|-----|----------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|
| ITEMS                              |     |                                                                                        |           |           |           |           |           |           |
| Input range                        | VDC | 24V nom: 18-36, 48V nom: 36-76V, 110V nom: 82-185V, 280V nom: 200-400V                 |           |           |           |           |           |           |
| Output Voltage Adj. Range 300-600W | VDC | 2.97-3.96                                                                              | 4.5-6     | 10.8-13.2 | 13.5-16.5 | 21.6-26.4 | 25.2-30.8 | 43.2-57.8 |
| Output Voltage Adj. Range          | VDC | 2.97-3.63                                                                              | 4.5-5.5   |           |           |           |           | 43.2-52.8 |
| Line Regulation                    | -   | 0.4% or 20mV (whichever is greater) over entire input range with constant load         |           |           |           |           |           |           |
| Load Regulation                    | -   | 0.8% or 40mV (whichever is greater) from no load to full load with constant input line |           |           |           |           |           |           |
| Ripple and Noise                   | mV  | 100                                                                                    |           | 150       |           | 240       | 280       | 480       |
| Series Operation                   | -   | Possible - Refer to installation manual                                                |           |           |           |           |           |           |
| Over Voltage Protection (2)        | %   | 150 - 180                                                                              | 125 - 145 |           |           |           |           |           |
| Over Current Protection            | %   | Approximately 105 - 150, automatic recovery                                            |           |           |           |           |           |           |
| Remote On/Off                      | -   | Short = ON, Open = OFF                                                                 |           |           |           |           |           |           |
| Remote Sensing                     | -   | PH100S, PH150S, PH300S, PH600S models                                                  |           |           |           |           |           |           |
| Parallel operation                 | -   | PH300S & PH600S only: Requires external circuitry                                      |           |           |           |           |           |           |
| Inverter Good signal               | -   | PH300S & PH600S only: Signal available for status of inverter                          |           |           |           |           |           |           |
| Thermal Protection                 | -   | Internal sensing, self resetting                                                       |           |           |           |           |           |           |
| Cooling                            | -   | Conduction or forced air. See application notes for cooling and heatsink selection     |           |           |           |           |           |           |
| Operating Temperature Range        | °C  | Baseplate temperature -20°C to +85°C (+100°C on PH300 & PH600)                         |           |           |           |           |           |           |
|                                    | °C  | -40°C start up versions available (1)                                                  |           |           |           |           |           |           |
| Storage Temperature                | °C  | -40°C to +85°C (+100°C on PH300 & PH600)                                               |           |           |           |           |           |           |
| Temperature Coefficient            | -   | 0.02%/°C                                                                               |           |           |           |           |           |           |
| Isolation                          | -   | Input to output: 3000VAC, Input to Baseplate: 2500VAC                                  |           |           |           |           |           |           |
| Isolation Resistance               | Ω   | Output to Baseplate 100mΩ at 500VDC and 70%RH                                          |           |           |           |           |           |           |
| Safety Agency Approval             | -   | UL60950-1, CSA22.2 No.60950-1, EN60950 and CE Mark.                                    |           |           |           |           |           |           |
| Warranty                           | yrs | 2                                                                                      |           |           |           |           |           |           |

**Note:** See Installation Manual for full details, test methods of parameters and application notes

(1) Please consult sales

(2) 50W: 165 - 240%, 300W - 600W: 140 - 190%

| Model Selector             |                    |                  |             |              |              |               |
|----------------------------|--------------------|------------------|-------------|--------------|--------------|---------------|
| Nominal Output Voltage (V) | Output Current (A) | Output Power (W) | 24V input   | 48V input    | 110V input   | 280V input    |
| 3.3                        | 10.0               | 33.0             | PH50S24-3.3 | PH50S48-3.3  | -            | PH50S280-3.3  |
| 3.3                        | 15.0               | 49.5             | -           | PH75S48-3.3  | -            | PH75S280-3.3  |
| 3.3                        | 20.0               | 66.0             | -           | PH100S48-3.3 | -            | PH100S280-3.3 |
| 3.3                        | 30.0               | 99.0             | -           | PH150S48-3.3 | -            | PH150S280-3.3 |
| 3.3                        | 50.0               | 165.0            | -           | -            | -            | PH300S280-3.3 |
| 3.3                        | 100.0              | 330.0            | -           | -            | -            | PH600S280-3.3 |
| 5.0                        | 10.0               | 50.0             | PH50S24-5   | PH50S48-5    | PH50S110-5   | PH50S280-5    |
| 5.0                        | 15.0               | 75.0             | -           | PH75S48-5    | PH75S110-5   | PH75S280-5    |
| 5.0                        | 20.0               | 100.0            | -           | PH100S48-5   | -            | PH100S280-5   |
| 5.0                        | 30.0               | 150.0            | -           | PH150S48-5   | PH150S110-5  | PH150S280-5   |
| 5.0                        | 50.0               | 250.0            | -           | -            | -            | PH300S280-5   |
| 5.0                        | 100.0              | 500.0            | -           | -            | -            | PH600S280-5   |
| 12.0                       | 4.2                | 50.0             | PH50S24-12  | PH50S48-12   | PH50S110-12  | PH50S280-12   |
| 12.0                       | 6.3                | 75.0             | -           | PH75S48-12   | PH75S110-12  | PH75S280-12   |
| 12.0                       | 8.4                | 100.0            | -           | PH100S48-12  | -            | PH100S280-12  |
| 12.0                       | 12.5               | 150.0            | -           | PH150S48-12  | PH150S110-12 | PH150S280-12  |
| 12.0                       | 25.0               | 300.0            | -           | -            | -            | PH300S280-12  |
| 12.0                       | 50.0               | 600.0            | -           | -            | -            | PH600S280-12  |
| 15.0                       | 3.4                | 50.0             | PH50S24-15  | PH50S48-15   | PH50S110-15  | PH50S280-15   |
| 15.0                       | 5.0                | 75.0             | -           | PH75S48-15   | PH75S110-15  | PH75S280-15   |
| 15.0                       | 6.7                | 100.0            | -           | PH100S48-15  | -            | PH100S280-15  |
| 15.0                       | 10.0               | 150.0            | -           | PH150S48-15  | PH150S110-15 | PH150S280-15  |
| 15.0                       | 20.0               | 300.0            | -           | -            | -            | PH300S280-15  |
| 15.0                       | 40.0               | 600.0            | -           | -            | -            | PH600S280-15  |
| 24.0                       | 2.1                | 50.0             | PH50S24-24  | PH50S48-24   | PH50S110-24  | PH50S280-24   |
| 24.0                       | 3.2                | 75.0             | -           | PH75S48-24   | PH75S110-24  | PH75S280-24   |
| 24.0                       | 4.2                | 100.0            | -           | PH100S48-24  | -            | PH100S280-24  |
| 24.0                       | 6.3                | 150.0            | -           | PH150S48-24  | PH150S110-24 | PH150S280-24  |
| 24.0                       | 12.5               | 300.0            | -           | -            | -            | PH300S280-24  |
| 24.0                       | 25.0               | 600.0            | -           | -            | -            | PH600S280-24  |
| 28.0                       | 1.8                | 50.0             | PH50S24-28  | PH50S48-28   | PH50S110-28  | PH50S280-28   |
| 28.0                       | 2.7                | 75.0             | -           | PH75S48-28   | PH75S110-28  | PH75S280-28   |
| 28.0                       | 3.6                | 100.0            | -           | PH100S48-28  | -            | PH100S280-28  |
| 28.0                       | 5.4                | 150.0            | -           | PH150S48-28  | PH150S110-28 | PH150S280-28  |
| 28.0                       | 10.8               | 302.0            | -           | -            | -            | PH300S280-28  |
| 28.0                       | 21.5               | 602.0            | -           | -            | -            | PH600S280-28  |
| 48.0                       | 6.3                | 302.0            | -           | -            | -            | PH300S280-48  |
| 48.0                       | 12.5               | 600.0            | -           | -            | -            | PH600S280-48  |

| PIN Assignments |                            |
|-----------------|----------------------------|
| Pin Description | Function                   |
| -Vin            | Negative Input Terminal    |
| +Vin            | Positive Input Terminal    |
| +S              | Positive Remote sense      |
| -S              | Negative Remote sense      |
| +V              | Positive Output Terminal   |
| -V              | Negative Output Terminal   |
| I OG            | Inverter Good Signal       |
| TRIM            | Output adjustment trim pin |
| CNT             | On/Off Control Terminal    |
| CS              | Current Monitor Signal     |



# PH-F Series

Full Function 50W to 300W  
DC-DC Converters

- High Density
- Wide Range Input
- Wide output adjustment capability
- Remote On/Off
- Fixed Switching Frequency
- International Safety Approvals
- Parallel Operation

## Key Market Segments & Applications

Telecom  
Custom Power Supplies  
N+1 redundant systems  
Scalable systems  
Point of Load

## PH-F Features and Benefits

### Features

- Low component count
- Wide output adjustment
- Signals to support N+1 redundancy
- Variety of input voltages

### Benefits

- High reliability demonstrated 5 million hours MTBF
- Avoids the need for custom modules
- Ease of use in redundant configurations
- Systems can operate from different input voltages

## Specifications

| ITEMS                       |     | 2V                                                                                        | 3.3V      | 5V  | 12V        | 15V  | 24V      | 28V       |
|-----------------------------|-----|-------------------------------------------------------------------------------------------|-----------|-----|------------|------|----------|-----------|
| Input range                 | VDC | 24V nom: 18-36, 48V nom: 36-76V, 110V nom: 82-185V, 280V nom: 200-400V                    |           |     |            |      |          |           |
| Output Voltage Adj. Range   | VDC | 1.6~2.4                                                                                   | 2.64~3.96 | 2~6 | 4.8~14.4   | 6~18 | 9.6~28.8 | 11.2~33.6 |
| Line Regulation             | -   | 0.4% or 20mV (whichever is greater) over entire input range with constant load            |           |     |            |      |          |           |
| Load Regulation             | -   | 0.8% or 40mV (whichever is greater) from no load to full load with constant input line    |           |     |            |      |          |           |
| Ripple and Noise            | mV  | 100                                                                                       |           |     | 150        |      | 240      | 280       |
| Series Operation            | -   | Possible - Refer to installation manual                                                   |           |     |            |      |          |           |
| Over Voltage Protection     | -   | 150 - 180%                                                                                |           |     | 125 - 145% |      |          |           |
| Overload Protection         | -   | Approximately 105 - 140%, automatic recovery                                              |           |     |            |      |          |           |
| Remote On/Off               | -   | Short = ON, Open = OFF                                                                    |           |     |            |      |          |           |
| Remote Sensing              | -   | Yes                                                                                       |           |     |            |      |          |           |
| Parallel operation          | -   | Using current share pin (PC). Will share within 5%, see app. notes for connection details |           |     |            |      |          |           |
| Inverter Good signal        | -   | Signal available for status of inverter                                                   |           |     |            |      |          |           |
| Auxiliary Bias Supply       | -   | 7-10V 10mA auxiliary voltage to supply power to interface circuits (AUX pin)              |           |     |            |      |          |           |
| Thermal Protection          | -   | Internal sensing, self resetting                                                          |           |     |            |      |          |           |
| Cooling                     | -   | Conduction or forced air. See application notes for cooling and heatsink selection        |           |     |            |      |          |           |
| Operating Temperature Range | °C  | Baseplate temperature -20°C to +85°C ( -40°C start up versions available (2))             |           |     |            |      |          |           |
| Storage Temperature         | °C  | -40°C to +85°C                                                                            |           |     |            |      |          |           |
| Temperature Coefficient     | -   | 0.02%/°C                                                                                  |           |     |            |      |          |           |
| Isolation                   | -   | Input to output: 3000VAC, Input to Baseplate: 2500VAC(1)                                  |           |     |            |      |          |           |
| Isolation Resistance        | Ω   | Output to Baseplate -100mΩ at 500VDC and 70%RH                                            |           |     |            |      |          |           |
| Safety Agency Approval      | -   | UL60950-1, CSA22.2 No.60950-1, EN60950-1 (except PH300F-24) and CE Mark.                  |           |     |            |      |          |           |
| Warranty                    | yrs | 2                                                                                         |           |     |            |      |          |           |

**Note:** See Installation Manual for full details, test methods of parameters and application notes

(1) 24V input models input to output: 2kVAC; input to baseplate: 2kVAC

(2) Please consult sales

| Model Selector             |                    |                  |             |             |              |              |
|----------------------------|--------------------|------------------|-------------|-------------|--------------|--------------|
| Nominal Output Voltage (V) | Output Current (A) | Output Power (W) | 24V input   | 48V input   | 110V input   | 280V input   |
| 2.0                        | 15.0               | 30               | -           | PH75F48-2   | PH75F110-2   | PH75F280-2   |
| 2.0                        | 20.0               | 40               | PH100F24-2  | -           | -            | -            |
| 2.0                        | 30.0               | 60               | -           | PH150F48-2  | PH150F110-2  | PH150F280-2  |
| 2.0                        | 60.0               | 120              | -           | PH300F48-2  | PH300F110-2  | PH300F280-2  |
| 3.3                        | 15.0               | 45               | -           | PH75F48-3   | PH75F110-3   | PH75F280-3   |
| 3.3                        | 20.0               | 60               | PH100F24-3  | -           | -            | -            |
| 3.3                        | 30.0               | 90               | -           | PH150F48-3  | PH150F110-3  | PH150F280-3  |
| 3.3                        | 60.0               | 180              | -           | PH300F48-3  | PH300F110-3  | PH300F280-3  |
| 5.0                        | 15.0               | 75               | -           | PH75F48-5   | PH75F110-5   | PH75F280-5   |
| 5.0                        | 20.0               | 100              | PH100F24-5  | -           | -            | -            |
| 5.0                        | 30.0               | 150              | -           | PH150F48-5  | PH150F110-5  | PH150F280-5  |
| 5.0                        | 60.0               | 300              | -           | PH300F48-5  | PH300F110-5  | PH300F280-5  |
| 12.0                       | 6.3                | 75               | -           | PH75F48-12  | PH75F110-12  | PH75F280-12  |
| 12.0                       | 8.4                | 100              | PH100F24-12 | -           | -            | -            |
| 12.0                       | 12.5               | 150              | -           | PH150F48-12 | PH150F110-12 | PH150F280-12 |
| 12.0                       | 20.0               | 240              | PH300F24-12 | -           | -            | -            |
| 12.0                       | 25.0               | 300              | -           | PH300F48-12 | PH300F110-12 | PH300F280-12 |
| 15.0                       | 5.0                | 75               | -           | PH75F48-15  | PH75F110-15  | PH75F280-15  |
| 15.0                       | 6.7                | 100              | PH100F24-15 | -           | -            | -            |
| 15.0                       | 10.0               | 150              | -           | PH150F48-15 | PH150F110-15 | PH150F280-15 |
| 15.0                       | 20.0               | 300              | -           | PH300F48-15 | PH300F110-15 | PH300F280-15 |
| 24.0                       | 3.2                | 75               | -           | PH75F48-24  | PH75F110-24  | PH75F280-24  |
| 24.0                       | 4.2                | 100              | PH100F24-24 | -           | -            | -            |
| 24.0                       | 6.3                | 150              | -           | PH150F48-24 | PH150F110-24 | PH150F280-24 |
| 24.0                       | 12.6               | 300              | -           | PH300F48-24 | PH300F110-24 | PH300F280-24 |
| 28.0                       | 2.7                | 50               | -           | PH75F48-28  | PH75F110-28  | PH75F280-28  |
| 28.0                       | 3.6                | 100              | PH100F24-28 | -           | -            | -            |
| 28.0                       | 5.4                | 150              | -           | PH150F48-28 | PH150F110-28 | PH150F280-28 |
| 28.0                       | 10.8               | 300              | PH300F24-28 | PH300F48-28 | PH300F110-28 | PH300F280-28 |

| PIN Assignments |                                     |
|-----------------|-------------------------------------|
| Pin Description | Function                            |
| -Vin            | Negative Input Terminal             |
| +Vin            | Positive Input Terminal             |
| +S              | Positive Remote sense               |
| -S              | Negative Remote sense               |
| +V              | Positive Output Terminal            |
| -V              | Negative Output Terminal            |
| AUX             | Bias voltage output (secondary ref) |
| IOG             | DC Good                             |
| TRIM            | Output adjustment trim pin          |
| CNT             | On / Off Control terminal           |
| SG              | Signal (CNT RTN)                    |
| PC              | Parallel control connection         |

| Options |                                |
|---------|--------------------------------|
| Suffix  | Description                    |
| -       | M3 Tapped inserts for mounting |
| /P      | Positive logic remote On/Off   |

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Орел (4862)44-53-42  
Пермь (342)205-81-47  
Самара (846)206-03-16  
Смоленск (4812)29-41-54  
Тверь (4822)63-31-35  
Тюмень (3452)66-21-18  
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